UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
WASHINGTON, DC 20250

and

FLORIDA AGRICULTURAL EXPERIMENT STATION
GAINESVILLE, FLORIDA 32611

and

ARKANSAS AGRICULTURAL EXPERIMENT STATION
FAYETTEVILLE, ARKANSAS 72160

NOTICE OF RELEASE OF 'JES' RICE - AN AROMATIC CULTIVAR ADAPTED TO THE SOUTHERN US

The Agricultural Research Service, U.S. Department of Agriculture; the Florida Agricultural Experiment Station; and the Arkansas Agricultural Experiment Station announce the release of 'JES' rice (Oryza sativa L.) cultivar. This cultivar is an early flowering (ef) line that also contains a semidwarf (sd) gene. The cultivar was induced by gamma radiation of the tall jasmine cultivar 'Khao Dawk Mali' (KDM), obtained in 1995 from the International Rice Research Institute (IRRI). KDM is tall, photoperiod-sensitive, and does not flower in time to set seed in most U.S. rice growing regions, so the early flowering mutant was induced in order to develop a cultivar that can be commercially grown in the U.S.

After processing through a quarantine generation at the Dale Bumpers National Rice Research Center (DBNRRC), Stuttgart, Arkansas, seeds of KDM were irradiated at 300Gy at the University of Florida in 1999. The following year, the M1 generation was grown in the Puerto Rico winter nursery, and 2000 M1 panicles were picked for planting panicle-to-row during the summer at the University of Florida Everglades Research and Education Center at Belle Glade, Florida, where the original KDM can set seed late in the season. In one panicle row, two M2 plants that flowered early, 82 days after planting, were selected and designated EF 00-12 P1 and EF 00-12 P2. Seeds from both were planted at Stuttgart, Arkansas, in April 2001, in single, densely planted progeny rows. Progeny of EF 00-12 P1 did not flower. Progeny of plant EF 00-12 P2 flowered, were tall, and showed variable seed set. Ten fertile M3 panicles were selected for panicle-to-row tests, which were conducted at Stuttgart in 2003.

Among the M4 progeny of the ten M3 plants, four segregated for semidwarf plants, with a pooled ratio of 44 tall:18 semidwarf, providing a satisfactory fit for a 3 tall:1 semidwarf ratio ($0.25<P<0.50$) indicating a single recessive gene. Of the 62 M4 plants evaluated, 60 were determined to possess the aromatic compound 2–acetyl-1-pyrroline (2-AP) at levels comparable

to Jasmine 85, a cultivar that was developed from a cross with KDM. In 2004 the 18 M4 semidwarf plants were progeny tested for plant type; all remained semidwarf.

Of the 18 semidwarf plants selected in 2003, two had low amylose (17%) like Jasmine 85. One low amylose semidwarf plant, designated KDM ef sd #3, was advanced through the 2004/2005 winter nursery in Puerto Rico and again in 2005/2006. Some 1000 panicles were selected with 420 panicles used for progeny tests in 2006 and the remainder being bulked for yield tests in 2006. DNA testing of 95 panicle rows indicated homogeneity for the RM190 and Exon1 markers associated with the Waxy gene and presence of alleles like Jasmine 85 indicating low amylose content. Six panicles were taken from each of these 95 lines for reserve seed; the 95 lines also were bulked for yield tests in 2007 and 2008. The low amylose content of KDM ef sd #3, now named JES (jasmine, early flowering, semidwarf), is similar to the amylose content for published values for the KDM parent. Like its parent, JES is pubescent. The JES cultivar traces back to the single semidwarf, low amylose M4 plant, KDM ef sd #3.

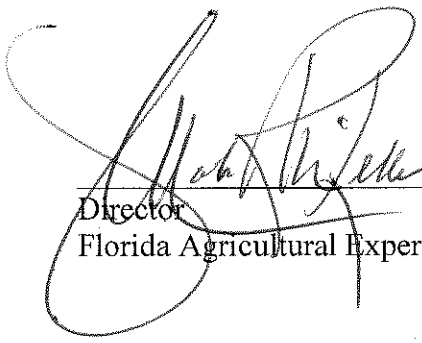
JES was entered in the Arkansas Rice Performance Trial (ARPT) coded as 'KDM Mutant' and was tested at 6 locations in 2006 and 5 locations in 2007 and in 2008. Averaged over the 3 years, JES yielded 8215 kg/ha-1 compared to 8198 kg ha-1 for 'Drew'; flowered in 93 days compared to 92 for Drew; showed 9% lodging compared to 6% for Drew; was 90 cm tall compared to 107 for Drew; averaged 54/69% head/% total milled rice compared to 58/70 for Drew; and had milled white rice grain weight of 18.75 mg compared to 16.39 for Drew. In a test conducted at the DBNRRC in Stuttgart in 2007, JES (coded 'indica 21') yielded 8500 kg/ha compared to 8900 for 'Francis'; flowered in 90 days compared to 86 for Francis; was 94 cm tall compared to 101 for Francis; had 55/69% head/% total milled rice compared to 56/70 for Francis; and had brown rice kernel weight of 18.7 mg compared to 16.0 for Francis. These results indicate that JES is comparable in yield, milling quality, and agronomic traits to other rice cultivars commercially grown in the southern U.S.

Analytical measurements for quality indicated that JES has cooking and taste quality very similar to Jasmine 85 and market basket samples of imported jasmine style rice. It has low amylose content (15.9%), low gelatinization temperature, and is aromatic (279 ng/g of 2-AP).

In 2008, leaf blast (Pyricularia grisea) scores were 2.0 for JES and 3.5 for Drew, indicating JES has strong resistance. Field ratings for sheath blight disease (Rhizoctonia solani) were 4.8 for JES and 6.5 for Drew, indicating that JES is moderately resistant.

Inquiries for seed of JES should be directed to: Christopher Deren, University of Arkansas Rice Research and Extension Center, 2900 Hwy 130 E, Stuttgart, AR 72160. Requests from outside the U.S. must be accompanied by an import permit. Seed also will be placed in the National Small Grains Collection, USDA-ARS, 1691 South 2700 West, Aberdeen, ID 83210, where it is available for research purposes, including development and commercialization of new cultivars. If this cultivar contributes to the development of additional cultivars it is requested that appropriate recognition by given to the source.

Signatures:

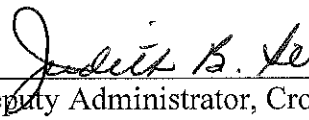


Director
Florida Agricultural Experiment Station

5-7-09
Date

Director
Arkansas Agricultural Experiment Station

6-10-09
Date



Deputy Administrator, Crop Production and Protection
Agricultural Research Service, U.S. Department of Agriculture

6/17/09
Date